

# THE FISH SUPPLY OF THE WEST COAST OF INDIA

BY

SIR REGINALD SPENCE, KT. M.L.C., F.Z.S. AND S. H. PRATER  
C.M.Z.S., M.L.C.

(With three Plates)

In No. 2 of Volume xxix, published as long ago as August 1923, the then editors, the writers of the present paper, published an article on the Fish Supply of our Western Coast based on the report of the work of the Steam Trawler *William Carrick* and promised 'in the next number of the Journal' to continue with a description of the principal edible fish and to comment on Mr. Hefford's remarks on the possibility of achieving commercial success with small boats and deep sea seining. The editors also proposed to make a reference to the needs of a market on shore.

They also stated that they would be pleased to include (if possible) any comments and suggestions members of the Society might have to make on what they had written. This statement is now their 'Saving Clause' and is the only excuse they have to offer for making No. 2 of volume xxxiv published in 1930 take the place of 'the next number' which was published in December 1923.

An old editor of the *Journal* did, it is true, write out a few months ago and enquire when his successors were going to get a move on. No other member made any comments, but Mr. F. V. Evans, one of our Vice-Patrons, helped us in a very practical manner. He provided us—and still provides us—with the financial means necessary to enable us to carry out our promise to issue illustrations of principal edible fish as, thanks to his generosity, we have now in the Prince of Wales' Museum a fine series of casts of the edible fishes of the Western Coast of India and are able to illustrate the second part of our paper. It is due to the above mentioned causes rather than to the pricking of an uneasy conscience that we carry on the story of the *William Carrick* and say something about the condition of the Fishing Industry in Bombay in 1930.

## THE 'WAGLI' (SKATES OR RAYS)

In chapter V of his report Mr. Hefford gives information as to the chief kinds of Fish caught. We may dispose, first of all, of the fish or fishes which were obtained in largest numbers. These were the 'Wagli' (Skates and Rays) and of these Mr. Hefford writes:—

'For total weight caught by the trawler, the fish classed under this name come easily first compared with any other kind taken, constituting 24 per cent of our total catches (by Weight). There are several different genera and species known under the same general

vernacular name of *Wagli* and called rays or skates by English-speaking people all over the world. They all belong to the group of cartilaginous skeletoned fish known to Science as the *Batoidei* and all are characterized by a flattened body with a rhomboidal or kite-shaped outline, sometimes more or less rounded, and a slender elongated tail. The family *Trygonidæ* is very abundantly represented by several different species in Bombay waters (Plate I). This is the family of Sting-rays or Whip-rays, so called because of the slender whip-like tail, armed with one or more long saw-edged spines, with which the fish is able to inflict painful inflammatory wounds. The flesh of these fish is practically indistinguishable in flavour from that of the European *Raidæ* (Skates and Rays) which fish, though formerly not much esteemed in England, nowadays commands a good market and is recognized as an excellent food. It is, as a matter of fact, much more nutritious and digestible than many other sorts of fish which command higher prices. The same may be said with greater emphasis about the Bombay *Wagli* in comparison with other sorts of fish obtainable here. Apparently its somewhat grotesque appearance and its apparently scaleless skin are drawbacks which at present limit its consumption to the poorer and lower classes of the fish-eating people of Bombay.'

'Besides the above mentioned family of *Trygonidæ*, represented in our catches by *Trygon walga*, *T. uarnak*, *T. zugei*, *T. sephen* and *Pteroplatea micrura*, and possibly others, other fishes of the *Wagli*, kind which were commonly taken were *Aelobatis narinari*, and species (undetermined) of *Myliobatis*, *Dicrrobatis*, and *Rhinoptera*.'

As an indication of the distribution of Skates and Rays in Indian coastal waters it is interesting to compare the catches made by the Trawler '*Lady Goschen*' on the Malabar Coast and the '*Golden Crown*' in the Bay of Bengal. On the Malabar Coast the commonest skates were *Trygon sephen* and *T. khulii*. One large example of the former taken by the Trawler scaled 1,000 lbs. The operations of the *Goldren Crown* show that in the muddy waters off the Sunderbans the most characteristic species were *T. uarnak* and *T. bleekeri*. They included 23 per cent. of the catches. One huge example of *T. uarnak* scaled 1,360 lbs. *Rhynchobatus djeddensis* was most plentiful off Chittagong, while further south on the Ganjam coast *T. kuhlii* and *T. zugei* were found to be the most common. Off the coast of Akyab the commonest species, according to Captain Lloyd, are *T. uarnak* and *T. walga*.

Skates are plentiful in the Bombay Market during the cold weather. Their abundance during the season is ascribed to the fact that they come close to the shore to produce their young. This is believed to be in accordance with the habits of most shore fishes which migrate to deeper waters as they grow larger. The Trawler, working further at sea than the local fishing boats are accustomed to, brought back, in the case of many species, larger examples than customarily sold in the market.

Various species of skates (*Trygon*, *Rhynchobatus*, etc.) are brought to the Bombay Market between October and May. They average from 1-50 lbs. and sell at Rs. 2 to Rs. 10 each according to size—the demand depends on other species of fish first available.

The *William Carrick's* estimated total catch of *wagli* was about 50,000 lbs., averaging approximately 30 lbs. for every hour of trawling. 21,724 lbs. of *wagli*, separately marketed as such, realized altogether Rs. 311, an average price of 2·7 pies per lb. The highest price per lb. was 8 pies (in January) and the lowest, half a pie per lb. (in November).

The statistics supplied by the Madras Fisheries Department for the year 1926-27, dealing with fisheries over a portion of the West Coast comprising the districts of South Kanara and Malabar, enumerate 42 marketable fishes arranged according to value and quantities obtained:—'Skates and Rays' figure 13th on the list. The total catch during the year amounted to 12,856 maunds, approximately 1,028,480 lbs. valued at Rs. 36,380, which works out at roughly 7 pies per pound. In a statistical account of the Fish supply of Madras city, 52 food fishes are given in the order of their value. 'Skates' come 15th on the list and realize on an average retail price of 3 as. 6 p. per lb.<sup>1</sup> The report says, 'Rays are highly esteemed as food by the masses.' The statistics above quoted show that this class of fish is better appreciated in Southern and South-Western India than on the Bombay coast. On the Burmese coast at Akyab *Trygon walga* is a favourite food fish of the Arakanese, another skate equally esteemed is *Pteroplatea micrura*.

9,946 lbs. of these fish, taken by the '*William Carrick*', were supplied gratis to the British Military forces in Bombay and, it is understood, were a very much appreciated ration.

It is rather curious, in view of the low estimation the flesh of these fish is held in Bombay, that the announcement in the windows of Fried-Fish shops in towns on the east coast of England 'Skates available to-day' should at once lead to an increase in the Fish Shop's Trade. It is also to be regretted that in view of the need of fertilizers on the land so much of the catch of *wagli* had to be emptied back into the sea as it did not pay the cost of handling and transit on shore.

#### THE GHOL (OR GOAL) FISH

The fish which came second in point of quantity (24,298 lbs. landed) but first in point of total value among all the kinds caught by the Trawler is the fish Mr. Hefford calls the '*Goal*', but the proper spelling of which is probably '*Ghol*'. In the market this fish is sold to us under the general name of Salmon, but the name Salmon is also applied to various species of *Polynemus*.

He writes:—

'It is a fish well known in Bombay markets, where it fetches a good price on account of its firm white flesh and good size. Its commercial position here may perhaps be compared with that of the cod in the fish markets of Europe or Northern America. It belongs to the genus *Sciæna* of the family *Sciænidae* to which belong numerous species distributed throughout the warmer seas of the world. Sixteen different species of *Sciæna* are recorded by Day as

<sup>1</sup> It should be noted that the rates quoted for the Bombay and Madras markets are retail prices.

occurring in India. Many of these are too small when full grown to possess appreciable commercial value. The large goal which were commonly taken in the trawl off Bombay, appear almost without exception to belong to the species *Sciæna diacanthus*. The weights of individual fish lay for the most part between 10 and 25 lbs., the average being about 15 lbs. Our best catch of goal was made on February 21, 1922 off Karachi in 14 fathoms of water when 75 fish having a total weight of 1,149 lbs. (after being gutted) were taken in a haul of 5½ hours duration. The species is known to occur in great abundance near the coast in the neighbourhood of Karachi in the months of April and May when it is the object of a great local fishery.'

On the south coast, off Calicut, the commonest species taken by the 'Lady Goschen' was *Sciæna bleekeri*. The largest catches were made between November and April. In the northern waters of the Bay of Bengal, as shown by the catches made by the *Golden Crown*, the commonest species was *S. vogleri*. In Madras city the species of *Sciæna* generally taken are *S. belangeri*, *S. albida*, *S. miles*, *S. maculata*, and *S. aneus*. Specimens of this genus in the Society's collections obtained from the Bombay market are:—*S. diacanthus*, *S. sina*, *S. maculata*, *S. ossa*, *S. glaucus* and *S. aneus*.

Despite Mr. Hefford's identification of his main catch of *Sciæna* as *S. diacanthus*, the two commonest species in the Bombay market are *Sciæna sina* and *S. glaucus*. Both these species attain a large size, 100 lbs. in weight and upto 6 feet in length. *S. sina* is included among the migratory fishes which visit our creeks and estuaries. The season for Ghol along the Bombay coast is from October to May. The fish are cut up and sold piece-meal, the price varying from 8 annas to 10 annas per lb. As regards prices obtained, Mr. Hefford writes:—

'Large goal are of value not only for the sake of the fish itself but also on account of the Swim bladder (the 'maw', 'pok' or 'sound') from which isinglass is obtained.'

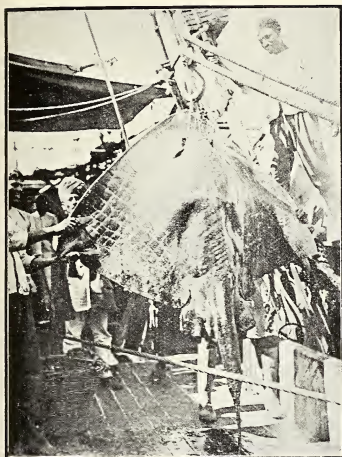
'The highest price per lb. realized from our sales was 11 annas. The lowest was 11 pies. The average for all sales was 4 annas 2.5 pies per lb.'

'An idea of the appearance of the fish may be obtained from the photograph.' (Plate I.)

On the Malabar coast the *Sciænidæ* range 9th as regards quantity and 10th in value. Between 1925 and 1926, 34,821 maunds were taken representing a total value of Rs. 57,227. In Madras city, *Sciænidæ* rank 5th in importance as regards weight and value. The total catch for the year 1921-22 amounted to 147,152 lbs. The price is lower than in Bombay, averaging 2 anns 9 pies per lb.

#### THE POMFRET

As regards the best known and most popular fish in Bombay, the *Pomfret*, Mr. Hefford thinks that possibly its relative abundance in the cold weather season to some extent detracts from its esteem. Mr. Hefford need not worry. The pomfret is missed so much in the rainy season that each cold weather it seems to gain in



Wagli (*Trygon microps*).



Goal (*Sciæna diacanthus*).



Ravas (*Polyuemus indicus*).



Wam (*Muraenesox talabonoides*).

(Reproduced from the Report on the Work of the Steam Trawler 'William Carrick'.)



Tambusa (*Lutianus johnii*).  
(Reproduced from the Report on the work of the Steam Trawler 'William Carrick').

appreciation and certainly when it is not with us nothing is said to its discredit but decidedly the reverse. Mr. Hefford writes:—

‘Europeans commonly refer to it as a ‘flat fish’ and erroneously class it with the *plaice* and *dab* of British waters but it is not a flat fish in the same sense as these (which have both their eyes and all their colouring on one side of the body only and have the habit of lying on the sand at the bottom of the sea where they find their food, and very rarely, if ever, leave the lowermost layers of the water). The pomfret is indeed flattened in shape but it has an eye on each side of its head and is coloured similarly on both sides of its body. It does not appear habitually to swim near the bottom or our trawl hauls would have contained more pomfret than they did. Occasionally small shoals of pomfret were observed from the trawler swimming quite close to the surface of the sea.’

‘The pomfret is scientifically known as *Stromateus cinereus*.<sup>1</sup> It is also commonly called the ‘white pomfret’ to distinguish it from the ‘black pomfret’ (*Stromateus niger*) which is quite common in these waters but is apparently very much less abundant than the former. In the ‘Fishes’ volume of the ‘*Fauna of India*’ series a third species (*Stromateus sinensis*) is given the English name of ‘white pomfret’, and the common pomfret is termed *silver pomfret* when immature and *grey pomfret* when adult. *Stromateus sinensis* however is so relatively little met with among the Bombay market fish that it calls for no further remark here.’

Since *S. cinereus* (Marathi, *Saranga*) is so universally known as the pomfret, it is only necessary to distinguish it from Day’s *S. niger* (Marathi, *Halwa*)—the *black* pomfret, and it seems preferable to adopt the fauna nomenclature here. It may be mentioned that *S. cinereus* in the fresh condition is characterized by the silvery lustre of the scales on the sides of its body which, while more conspicuous in the young are by no means lacking in the big fish. We therefore call *S. cinereus*—the silver, and *S. sinensis*—the white pomfret.

While *S. sinensis* is rare in Bombay, it is not uncommon on the Malabar coast during the South-west monsoon. It is the commonest pomfret in the Madras market and is quite plentiful on the Arakan and Bengal Coast. Dr. Jerdon describes it as the best flavoured of the three pomfrets Mr. Hefford writes:—

‘The total quantity of pomfrets caught by the trawler was 6,876 lbs. of which 5,939 lbs. sold in Bombay market realized a total sum of Rs. 2,618. Our biggest single haul was 490 lbs. in a 3½ hours’ tow made on October 6, 1921, off Bombay in 24 to 25 fathoms (Voyage *XVIII*, Haul 3). The prices realized by our sales ranged from Rs. 1-3-7 per lb. in July (during the monsoon when loca boats are not at sea) to 2 annas per lb. in November and December,

<sup>1</sup> These are the scientific names in Day’s works on Indian Fishes which are the ichthyological books of reference most likely to be easily accessible to the reader. It may, however, be mentioned that the present-day authorities do not recognize these generic names. Nor is the black pomfret regarded as a true pomfret at all. The similarity between the two species is, as a matter of fact, quite superficial.

a time when there is a plentiful supply available in Bombay. The average for all pomfret marketed was 6 annas 11·9 pies.'

Between June and September pomfrets are very scarce in the Bombay market. The season for pomfret commences about October, the largest quantities are marketed between November and February, the prices, in good seasons, then range from four to six annas for a pair of good, sizable fish. At the commencement of the hot weather the numbers decrease and prices range from Re. 1 to Rs. 1-8-0 a pair. The fish available are much smaller in size. A southward migration of pomfrets appears to take place between March and April when this species becomes plentiful on the South Kanara coast, while in July and August they are abundant further south on the Malabar coast. A similar southerly migration seems to take place on the East Coast of India. Dr. J. T. Jenkins, in his observation on the working of the '*Golden Crown*' in the Bay of Bengal, says that pomfrets were most abundant in the northern part of the Bay of Bengal during January and February when vast shoals were observed swimming liesurely past the trawler; while in Madras City the statistical report indicates that the fish is most plentiful between June and November. A curious feature about the catches by the '*Golden Crown*' was that the largest hauls were made by day-light. Between February 9 and 15, 20 hauls were made, 10 by day and 10 by night. The total weight secured was 2,773 lbs. of which only 65 lbs. were taken at night. Pomfrets in the Bombay market were found 'in roe' during September, and young fish measuring a few inches in length are taken in plenty during November and December. The young of *S. sinensis* are observed in plenty along the coast and estuaries of Bengal during March.

#### THE 'KAREL'

The next fish in importance in Mr. Hefford's list is the 'Karel.' He writes:—

'This fish is not well-known in Bombay, but it may undoubtedly be classed among the 'prime' qualities. It is a perch-like fish corresponding with the species described and figured by Day as *Pristipoma maculatum*. The name *karel* is that used by the Ratnagiri deck hands of the trawler, but it appears to be similarly used in Bombay also, though at least some people apply the name *Karkara* to the same fish. Day (*Fauna of India*—Fishes I, p. 510) gives *Karkulla* as the Marathi name of the species. Dr. Jenkins in his report on the working of the Steam Trawler '*Golden Crown*' includes it with one or more other perch-like forms under the name *Bekti* (used as a class name—the *bekti* of Bengal being strictly applicable to the species *Lates calcarifer* which is the *Khajura* of Bombay). The Karel is a bright handsome fish with a dark greenish purple back and silvery sides. On those caught near Bombay the silvery lustre is associated with yellow pigment which gives the fish a pale golden appearance, but on the Sind grounds the fish are more purely silvery. The younger fish are characterized by the presence of dark bars on the sides which disappear with age. Its flesh is firm and flaky and of good flavour. It soon became the



favourite fish of the Europeans on the trawler and was eaten in preference to any other. If it became better known it would certainly find favour among the consumers of the best kinds of fish in Bombay and would command better prices than we made.'

Writing about this fish, Day remarks, 'It is fair as food, but not much esteemed.'

'The total weight of Karel caught by the trawler was 15,190 lbs. The total weight of large Karel marketed as such in Bombay was 8,411 lbs. which realized a total sum of Rs. 1,209. The price per lb. varied from seven pies in November to four annas in August. The average was 2 annas 3·6 pies per lb.'

'The largest Karel taken in the trawl was 25 inches long. The usual range of size of the fish marketed as Karel was from about 15 to about 22 inches. The corresponding range in weight is 2 lbs. to 6 lbs. Our largest take in a single haul was 807 lbs. (about 250 fish) in a haul of 3¾ hours' duration made on August the 29, 9 miles east by south from Kundari 15 to 16 fathoms.'

On the Madras coast *P. maculatum* is common between February and May. On the Malabar coast it does not appear to be abundant. The total catch for the year 1925-26 was only 421 maunds valued at Rs. 577.

#### THE 'BAHMIN'

Fourth in order of value among the fish landed by the trawler is the fish known to anglers as the *Bahmin* and to Bombay landladies and hotelkeepers as the Indian Salmon. The total landings of this fish were 3,254 lbs. and realized Rs. 1,215.

Mr. Hefford writes:—

'Three distinct species of the genus *Polynemus* (viz., *P. indicus*, *P. plebeius* and *P. tetradactylus*) are included in this class to all of which in the market and in the menus the English name of Salmon or Indian Salmon is applied. While possessing absolutely no resemblance to the salmon of northern waters, these fish have excellent eating qualities which are reflected in their market prices. I give the Marathi name *Ravas* as a sort of class name for market purposes, following in this respect the practice of the members of the Ratnagiri fishing community who were on the 'William Carrick'. The name 'Ravas' is applied generally to all *Polynemus* species. The most abundant species taken by the trawl in our catches, *P. indicus*, which is also the most frequently seen in Bombay fish markets, is however commonly known in Bombay as *dara* (Plate I). The same name is often applied to the larger specimens of *P. tetradactylus*. There are several records from our earlier voyages in which the particular species is not shown, but from the records where the specific identity is clear, we obtain for *P. indicus* (*dara*) a total of 88 large fish of a total weight of 1,135 lbs. (average 13 lbs.). The heaviest individual fish recorded was 34 lbs. (total length 3' 8"). The largest catch in a single haul was one of 17 fish weighing altogether 435 lbs. made in 3½ hours on January 30, 1922, 23 miles WNW from Kundari in 22 fathoms. There are records of 48 small-sized fish of this species with a total weight of 58½ lbs. and of 35 specimens of small size the weight of which was not separately taken.'

'*Polynemus plebeius*, which resembles *P. indicus* in having five of the free filament-like rays at the base of the breast fin which are characteristic of the family, but may be fairly readily distinguished from the latter species by the relatively greater thickness of the root of the tail (called by zoologists the caudal peduncle) and by the proportionately larger eye, was of less common occurrence in our catches and never of sufficiently large size to be of commercial importance. Day's works give no record of sizes for this species. Fifty-five specimens altogether were recorded, the largest being  $11\frac{1}{2}$  inches in length.'

This species was found to be common in the muddy waters of the coast of Arakan where good catches were made by the 'Golden Crown.'

'The third species, *Polynemus tetradactylus*, differs from the above two in having only 4 free rays to the pectoral fin. It is a more shapely fish than the others and has the silvery sheen and the graceful body contour which call to mind comparison with the true salmon of the north. Our records of fish weighed contain altogether 83 of this species with a total weight of 331 lbs. 9 others are recorded but no weights given. Only one specimen of large size is definitely included among these records and that is one of  $15\frac{1}{4}$  lbs. The best catch recorded is one of 40 fish weighing altogether 220 lbs. made on July 12, 1921, in 22-25 fathoms, 21 miles E.N.E. from Kundari, but there is some doubt as to whether the whole of this catch actually consisted of this one species of *Polynemus*.'

'The price realized varied from 13 annas 9 pies per lb. in December to 3 annas 6.3 pies in February. The average is 5 annas 11.9 pies per lb. The 'pok', 'maw' or Swim bladder of the ravas is thick-walled and rich in gelatine like that of the goal and is similarly of commercial value as a source of isinglass.'

The species of *Polynemus* obtained from the Bombay market in the Society's collection are *P. indicus*, *P. sextarius*, *P. heptadactylus*, *P. plebeius*, and *P. tetradactylus*.

Of these the largest is *P. tetradactylus*, the Bahmin, famous as a sporting fish, which is said to attain a length of 6' and scales as much as 168 lbs. (Wallinger).

*P. indicus* grows to about 4', and according to Day is rarely over 20 lbs as compared with Mr. Hefford's fish of 3' 8" weighing 34 lbs. *P. plebeius* goes up to 53 lbs. (Wallinger). *P. heptadactylus* and *P. sextarius* are small fishes not much above 6" to 8" in length and about 2 lbs. in weight. *P. plebeius* (Ravas), *P. tetradactylus* (The Bahmin or Dara which is the name Wallinger gives to the large Bahmin) and *P. tetradactylus* (Shendwa) are listed among the migratory fish which visit our creeks and streams and rivers during the monsoon for spawning purposes. 'Ravas' are abundant at the mouth of the Tapti and its tributaries in May and June. Hundreds of maunds of fish are taken by the fishermen in our creeks before the monsoon and again in October.

*P. paradisus* known on the Bengal side as the 'Mango Fish' similarly runs up the rivers of the East coast during the monsoon and the cold months. It commences to be taken in June.

## THE 'WAM'

Mr. Hefford writes of the 'Wam':—

'This is the Marathi name for fish belonging to the genus *Muraenox* of which there are three species known in Indian seas (Plate I). Our catches consisted almost entirely of *M. talabonoides*. An occasional *M. cinereus* was observed, but we have no definite record of the third species, *M. talabon*. One distinguishes between them by the arrangement of their teeth; but observations of the dental characteristics of a live *wam* are very apt to be attended by a sudden and vicious display of their utility as a weapon of offence. In its tendency to snap like an angry dog the *wam* resembles the European conger to which it is also very similar in body form and in its edible qualities. The jaws of the *wam*, however, are longer and more slender than those of the conger. It appears to be associated with an entirely muddy bottom habitat, while on the other hand, the European conger is a frequenter of rocky ground. The flesh of the *wam* is somewhat tough when fresh, but it has better keeping qualities than the more tender fish. Its scales are so small and so embedded in the skin that they appear to be absent, which may detract from its market value. An idea of the appearance and size of the *wam* taken in the trawl may be obtained from the photograph.'

'All our *wam* were of large size varying in weight between 7 and 17 lbs., the majority being about 9 or 10 lbs. weight and about 5 feet long. The smaller sizes obviously escape through the meshes of the net. Altogether 16,337 lbs. of *wam* were landed for market, of which 14,703 lbs. were sold as such and realized Rs. 1,103. The highest price realized was 2 annas per lb. in June; the lowest 5 pies per lb. at the end of September and middle of November. The average price was 1 anna 2·4 pies per lb. The 'pok' of the *wam* is marketable as a source of isinglass.'

In Bombay and Madras, eels are abominated by the higher caste Hindus who regard them as Sea-serpents and they are rejected by Mohammedans because they are scaleless. Scaleless fish are forbidden to Mohammedans, Jews and were at one time to the British Navy. There used to be an old rule in the Navy that scaled fish were wholesome as food and that scaleless fish were not. This is not always the case, many fish with large scales are poisonous while scaleless fish, like some of our *Siluridæ* (Cat fishes), are wholesome and nourishing. It is interesting in this connection to note that the fresh blood of some of the eels of the genus *Muraena* is highly poisonous if injected into the blood of a mammal. Its venomous nature is due to the presence of ichthyotoxin which is compared to the toxalbumen of vipers. The toxicity of the blood varies with the season and environment. A guinea pig injected with the serum of the blood of a common eel was dead in three minutes.

The following species are in the Society's collection and were obtained in the Bombay market. *Muraena tessalata*, *M. undulata* and

*Muraenox telabonoides*. The last species is plentiful between October and March. The weights range from 1 lb. to 151 lbs. :—

#### THE 'TAMBUSA'

Next in order Mr. Hefford places a fish with the Marathi name 'Tambusa' (Plate II). He says :—

'The fish marketable under this name belong to the genus *Lutianus* of which there are many different species in Indian seas. In our hauls the species *Lutianus johnii* was predominant. It is a particularly handsome fish, rather like a robust-looking Karel in general shape and even more beautifully marked than that brilliant-fish. The Marathi names, Tambusa, Tambus or Tambre, were obviously suggested by its shiny and ruddy appearance. Its sides have a pale golden sheen and the upper half of the body is speckled with a rich brown colouring associated with red. The smaller fish are less richly coloured. The flesh is firm and of good flavour, not unlike that of Karel but perhaps still more like that of the big ravas (dara) or Indian Salmon. If properly known it would certainly be regarded as one of the 'prime' fishes of Bombay. The range of size usually lay between about 24 inches (8 lbs.) and 30 inches (12 lbs.) The largest observed was 33 inches long and weighed 17½ lbs.'

'The only other *Lutianus* species of which we caught any appreciable quantity was *L. annularis* which is entirely bright red in external colouring,<sup>1</sup> but as regards edible qualities not unlike the other. The usual sizes met with lay between 16 and 24 inches. The greatest length recorded was 26 inches. The Ratnagiri men on the trawler called it *Lalgon* (i.e., Red One), but I do not know how far this may be regarded as the distinctive name for the species. It was called tambusa for market purposes and in the trawling records 'Red Tambusa' to distinguish it from the other which we called 'Speckled Tambusa'. Altogether, 6,065 lbs. of tambusa were sold as such in Bombay and realized a total sum of Rs. 801. The trawler records show a total catch of 5,181 lbs. of the speckled and 1,840 lbs. of the red sort. The best single haul of the former was made on February 20, 1922, off Karachi in 14 to 7 fathoms (hauling 31 miles S.E. ¾ E. from Cape Monze) when 70 fish weighing 719 lbs. were caught in 3½ hours. In the case of the red tambusa a haul of 3½ hours on November 11, 1921 in 23 fathoms off Diu Head (124 miles NW ½ W from Bombay) produced a catch of 179 fish weighing 992 lbs. It would thus appear that both species are more abundant to the north-west than in the vicinity of Bombay. The speckled species was found to be the more general in its distribution both as regards locality and season. Practically all our red tambusa were taken in the months of October and November.'

'The best price realized for speckled tambusa was 6 annas 3 pies per lb. (in October), the lowest was 11 pies (in November). On November 15, when 1,491 lbs.—practically all red tambusa—were marketed, an average of only 8 pies per lb. was realized. The average price from all sales of tambusa was 2 annas 0·6 pies per lb.'

<sup>1</sup> The dark markings on the head and nape and at the base of the tail are inconspicuous on the freshly-caught fish.

Cherry-red tambusa frequent in the Bombay market are *Lutianus argentimaculatus*, *L. roscus* and *gibbus*. *Lutianus johnii* to which Mr. Hefford refers is listed as one of the migratory fish which visit the estuaries and creeks. Other species obtained in Bombay are *L. kasmira*, *L. lineolatus* and *L. rivulatus*.

#### THE 'SHINGALA'

Third in order of abundance in the trawler catches and generally distributed over the muddy grounds in the neighbourhood of Bombay, comes the 'Shingala'. Of this fish it is recorded:—

'Well-known though not very highly esteemed in the Bombay fish-markets. They appear to be as abundant in the Bay of Bengal as they are this side. In the *Golden Crown* reports, they are termed 'gurnards', a name given by the British crew of the Bengal Government trawler on account of their resemblance to the European fish of that name in having broad bony heads and a liberal armament of spikes. The British crew on the '*William Carrick*' called them 'Cat fish',<sup>1</sup> a name almost universally applied to the *Siluridae*, the family to which these fish belong and which is represented by numerous species in the fresh waters and seas of the tropics in both hemispheres. Many different genera and species of cat fish are known in the larger rivers and lakes of India, the purely marine species being relatively few. From the commercial point of view, the marine genus *Arius* is the only one of appreciable importance and to this genus belong practically all the Shingala landed by the '*William Carrick*'. As to the species, there were two or three and possibly as many as half a dozen different ones among our catches but their precise differentiation was a tedious and difficult matter to which sufficient attention could not be paid on the trawler and therefore specific names cannot here be given with confidence.

'Our total catch of Shingala was over 16,000 lbs.—an average of almost 9½ lbs. for every hour of trawling. Our biggest catch in a single haul was 1,010 lbs. taken on August 24, 1921, 22 miles S.W. ½ W. from Janjira in 23 to 11 fathoms in a 3½ hours' haul.'

'The largest-sized individual noted was 35 inches long and weighed 14 lbs. The usual range of size was from about 15 to about 24 inches (2 to 6 lbs).'

'The total sum realized by the sale of 12 maunds 321 lbs. of Shingala was Rs. 568, averaging 8·8 pies per lb. The highest price realized was 2·1 annas per lb. in August and September; the lowest was 2 pies in November.'

'This fish only appears to be eaten by the lower classes. Its scaleless skin, which rather easily rubs off, and its colour which is usually leaden grey and sometimes of a livid blue, are points which go against it as a market fish. The flesh too is somewhat soft though of perfectly good flavour when fresh. The swim-bladder or 'poks' yield isinglass'.

---

<sup>1</sup> From the whisker-like appearance of the feelers or barbels arranged round the mouth.

Marine Cat fishes from the Bombay market in the Society's reference collection are *Plotosus arab*, *Rita buchanani* and *Arius sona*. There is also a plaster cast of *A. dussumieri*. On the Malabar coast *Siluridae* (cat fishes) rank 6th in quantity of catches and 3rd in value. The total catch for the year 1925-26 amounted to 65,433 maunds equivalent to 5,234,640 lbs. valued at Rs. 2,68,089. Catches are made throughout the year, but the quantities increase between September and January. In Madras City cat fishes though not eaten by the richer classes enter largely into the dietary of the poor, the same applies to Bombay. The total weight of cat fish brought to Madras city in 1921-22 amounted to 73,123 lbs, valued at Rs. 10,646. The average price paid being 2 annas 4 pies per lb.

Cat fishes sold in the Bombay market range from 1 lb. to 121 lbs. Retail prices range from 4 annas per lb. in the full season to 5 or 6 annas per lb. in the off season.

#### THE 'DORI.'

Akin to the popular *Goal* and next on the list comes the 'Dori'. The report says:—

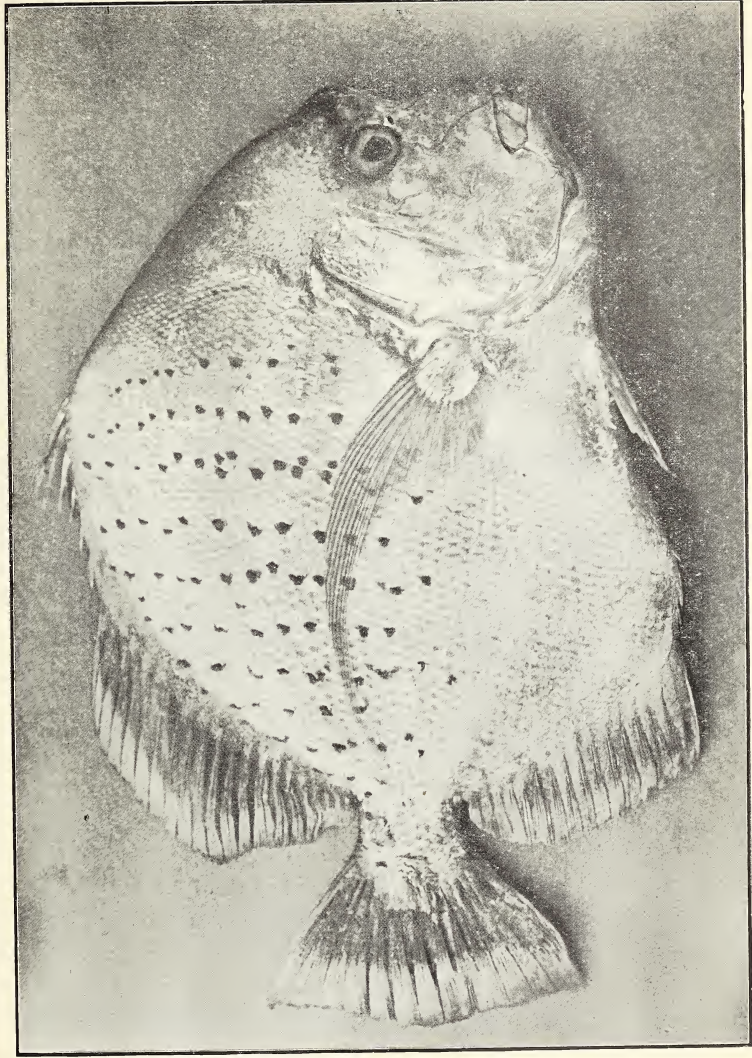
'This fish is known on the Ratnagiri and Canara side as 'Wanwas.' Its scientific name is *Sciaenoides brunneus* and, as that name suggests, it has a close relationship to the *Sciaenas*, to the same family as which in fact it belongs. It has the appearance of a very slender goal, which fish it also resembles in taste.'

'Our total landings of dori were 4,060 lbs. of which 3,292 lbs were marketed as such (the rest in mixed lots) and fetched altogether Rs. 550. Average price, 2 annas 8 pies per lb. The highest price realized was 3 annas 6·5 pies per lb. in December; the lowest 1 anna 6 pies in February. Day (*Fauna of India. Fishes*, Vol. II, p. 127) says it is common at Bombay in October but from the beginning of September to the middle of December, this fish was almost entirely absent from the trawler catches. Possibly they migrate inshore at this season. They were not found at all off the Sind coast.'

'This species showed more variety in size than most of the sorts taken in the trawl. The longest individual recorded measured 43 inches.

#### THE 'CHAND'

'The fish known to science as *Drepane punctata* is, from its shape and gleaming silvery colour, very appropriately named *chand*, *chandva* or moon-fish. It is one of the most commonly occurring species in the Bombay neighbourhood and very few catches were made which did not contain *chand* in greater or less numbers. The size of these fish was as a rule very small, from 5 to 8 inches long being the usual range. Small *chand* were frequently not weighed separately but were included in the class called 'small mixed' in both trawler and market records. *Chand* were included in the records of catches from 195 hauls. In 108 of these, they were separately weighed and in 5 cases together with a second species also loosely called 'chand' by the crew but which was as a matter of fact the Karawada (*Ephippus orbis*). The weighings at sea



CHAND (*Drepane punctata*).  
(Reproduced from the Report on the work of the Steam Trawler 'William Carrick').





totalled 3,435 lbs. from which (it is estimated) 135 lbs. may be subtracted as representing approximately the weight of the *Ephippus orbis* included, thus leaving 3,300 lbs. as the total weight of the *chand* weighed on the trawler. Out of this total the quantity of large *chand* (i.e., exceeding 12 inches in length) which were caught amounted to only 257 fish, the estimated weight of which would be about 1,200 lbs. The total weight of *chand* as weighed separately when landed for market was 2,594 lbs. out of which 110 lbs. were sold in mixed lots. The 2,484 lbs. of *chand* marketed as such realized a total of Rs. 465, an average of 2 annas 11·2 pies per lb. The highest price realized was 3 annas 5·5 pies per lb. in October; the lowest was 4·8 pies in November.

'A remarkable feature about our catches of *chand* was the absence of fish which might be termed *medium* size. The small rarely exceeded 8" in length and their individual weight would not as a rule exceed 3 or 4 ounces. Of the large fish, however, the smallest was usually not less than 12 inches long and not less than 3 lbs. in weight. Only 6 medium-sized fish were recorded, their lengths lying between 8 and 11 inches. The largest recorded was a little over 18 inches long. Day says *chand* are 'in most places esteemed as food.' They ought to be esteemed everywhere for the larger ones at least are of excellent edible quality. If properly known, they would, I am convinced, command a good price in Bombay.'

*Chand* are plentiful in the Bombay market between July and October and the weights vary from 1 to 5 lbs. Retail prices are from 3 to 4 annas per fish.

The above-mentioned ten fish, namely—

Goal or 'Ghol'—*Sciæna* species, probably *Sciæna diacanthus* as it is the large-sized species which is the principal catch.

Pomfret—*Stromateus cinereus* (The Silver Pomfret)

*Stromateus niger* (The Black Pomfret)

Karel—*Pristipoma maculatum*

Bahmin, *Ravas* or *Dara*—

*Polynemus indicus*

*Polynemus plebeius*

*Polynemus tetradactylus*

} (The Indian Salmon)

Wam—*Muraenesox telabonoides*

Tambusa—*Lutianus johnii*

Shingala—Family *Siluridae*, genus *Arius*, species

Dori or Wanwas—*Sciænoides brunneus* (allied to the Goal Fish which it resembles in appearance (though more slender) and in taste)

*Chand* or *Chandva*—*Drepane punctata* (The Moon Fish), and, last of the ten in present-day value but first in quantity and possibly greatest in the potentiality of enhanced value in the future

Wagli (Skates or Rays)

appear to constitute the fish stocks of chief commercial importance available in the vicinity of Bombay for exploitation by

trawling or any other bottom-fishing method. There are however other fishes which among the trawler's landings were of relatively minor importance but which require brief notice in order that a proper idea may be presented of the kinds of fish catchable by the trawl in the seas near Bombay.

Mr. Hefford in his report writes:—

'The most important of these is the *Balu* (*Chrysophrys berda*) of which altogether 887 lbs. were marketed and realized Rs. 139, an average price of 2 annas 6 pies per lb. This fish is highly esteemed by all who know its edible qualities. In the Madras Presidency it has received the English name of 'Black-Rock Cod' though its resemblance to the well-known cod of northern seas is difficult to trace. The name 'Black Sea Bream' would better describe its appearance and systematic position in the families of fishes. Our best catch was one of 115 fish weighing altogether 95 lbs. made in 4½ hours in 16 to 19 fathoms, hauling 15 miles W½S from Kundari, on December 17, 1921. The individual sizes usually ranged from 8 to 12 inches (½ lb. to 1½ lbs. weight). Our largest recorded was 14 inches long.'

'There is another fish with the scientific name of *Pagrus spinifer* that figures among our catches which bears a close resemblance to the *Palu* and in fact both belong to the same family (*Sparidae*). In colouring they are very different, the *Palu* being silvery grey with the edges of the scales outlined in black and a good deal of black about the fins. *Pagrus spinifer* is predominantly pinkish in colouring which renders it very attractive to the eye. As an edible fish it is as excellent as the more sober-coloured *Palu*. Though quite common off the Sind Coast we found very few of this species in the neighbourhood of Bombay and I have not yet succeeded in finding a Marathi name for it. Our Ratnagiri crew called it *Palu* and then, when its distinction from *Chrysophrys berda* was pointed out, qualified it as *Lal Palu* which, failing an original, might be adopted as its local name. In our trawling record it is termed *Red Palu*. This is the species which, in the *Golden Crown* reports, goes by the name of 'Red Flats' which was obviously a rough and ready improvisation by the English crew of that trawler. Our European fisherman on the *William Carrick* called it the *Carrick Bream* from the close resemblance that it bears to the British Sea-Bream which belongs to the allied genus *Pagellus*. An English-speaking fisherman of Karachi referred to it as 'Red Snapper' and it is, as a matter of fact, closely related to that important Australian food fish as well as to another Pacific species (*Pagrus major*) which, as the *Red Tai* or *Akadai* figures so largely in the *menus*, the art and the mythology of Japan. *Pagrus spinifer* is a familiar and highly esteemed food fish in Karachi where it is called Dant by the local fisher-people.'

'Our biggest catch of *Red Palu* was one of 625 lbs. numbering approximately 900 fishes of sizes ranging from 6½ to 16 inches. This was from a tow of 5¼ hours' duration made on December 6, 1921, hauling 52 miles south-east from Cape Monze in 17 fathoms depth. This fish was landed for Bombay market on only two occasions. On December 13, 1921, 46 lbs. realized Rs. 9 (average 3 annas

2 pies per lb.). On March 1, 975 lbs. sold for Rs. 50, an average of only 9·8 pies per lb., which low price was doubtless due to the fish being practically unknown in Bombay.

'The *Surmai* or *Seer-fish*,<sup>1</sup> belonging to the genus *Cybiium* is fairly well-known and esteemed in the Bombay fish-markets. They do not figure very abundantly in the trawler-catches and those we secured were all of comparatively small size. Our best haul was on February 11, 51 miles south-east from Kundari Island in 14 to 12 fathoms depth when 49 fish having an aggregate weight of 116 lbs. were taken in a 3½ hours' tow. The sizes ranged from 14½ to 26 inches. It will be noted that this haul was made in comparatively shallow water. It is probable that these fish do not habitually swim so near the bottom as to come within the reach of the trawl. Of the five known Indian species, *Cybiium lineolatum* and *C. commersonii* appear to be the most commonly occurring in Bombay waters.'

*Cybiium commersonii* to which Mr. Hefford refers is described by Major Lane as an excellent game fish. He calls it the 'Cheetah of the Ocean' and says it preys on mullet, shooting up from below into a school of them and leaping with its prey in its mouth quite 12 feet out of the water.

Common *Surmai* in Bombay to which Mr. Hefford does not refer are *Cybiium guttatum* and *C. kuhlii*. *C. guttatum* is abundant in the market from October to January. It is excellent in flavour and salts well and is sold in a dried and salted condition throughout the year. It is the *Surmai* which is selected for making that much-favoured concoction known as 'Tamarind Fish'. On the Malabar Coast, Seer fish rank 16th as regards quantity and 9th in value. The total catch for 1925-26 was 12,539 maunds valued at Rs. 77,616. The total amount of seer brought to the Madras market in 1922 was 33,004 lbs. valued at Rs. 13,660.

In the Colombo markets, which receive their supplies from all the fishing centres round the coast of Ceylon, the best months for *Cybiium* are November, December and January, when the approximate quantities sold daily in 1929 were 3,200, 3,950 and 2,000 lbs. respectively. The species indicated are *C. guttatum* and *S. interruptum*.

Mr. Hefford writes:—

'The 477 lbs. of *Surmai* sold as such in Bombay market realized an average price of 3 annas 5 pies per lb. The highest was 3 annas 10·5 pies per lb. and the lowest 1 anna 2 pies.

'The *Dagola* or *Dagol*, known by the scientific name *Chorinemus*, is another sort of fish with which the fishermen of these coasts are well acquainted, but which came but rarely to our net. Like the *Surmai* this is a swift-swimming fish and probably moves about in higher levels in the water than are fished by the trawl. About 500 lbs. of *Dagola* were caught altogether. 406 lbs. marketed in Bombay realized Rs. 67; an average price of 2 annas 7·6 pies per lb.'

---

In Karachi, however, the ravas (*Polynemus*) is called Seer,